

Remarks

The Office action mailed May 3, 2005, has been reviewed and carefully considered. After entry of this amendment, claims 1-9, 11-13, 16, 18-23, 29-31, 34, 36-58 and 66-85 should be pending. Claims 1, 6, 11-13, 16, 21, 23, 29-31, 36-45, 50, 51, 53, 54 and 58 are currently amended. Claims 10, 14, 15, 17, 24-28, 32, 33, 35 and 59-65 have been cancelled. New claims 66-85 have been added. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

I. Cancelled Claims

Claims 10, 14, 15, 17, 24-28, 32, 33, 35 and 59-65 have been cancelled without prejudice or disclaimer to expedite prosecution and for economic reasons. Applicants reserve all rights to pursue these and similar claims in a continuing application.

II. Minor Amendments

Claims 38, 39, 41, 42, 50, 51, 53 and 54 have been amended to change “the biofilms” to “biofilm” in accordance with the rules on antecedent basis. These amendments do not narrow the literal scope of the amended claims.

III. Rejection of Claims 1, 3-6, 8-13, 18, 20, 21, 23, 26, 27, 30-32, 34 and 35 over Souter - 35 U.S.C. § 102(e)

The ‘326 Publication is not a Proper Reference under 35 U.S.C. § 102(e)

Claims 1, 3-6, 8-13, 18, 20, 21, 23, 26, 27, 30-32, 34 and 35 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Publication No. 2004/0217326 (the ‘326 publication) of U.S. Application No. 10/769,226 (the ‘226 application). Applicants respectfully traverse this rejection and request that it be withdrawn.

The ‘226 application has a filing date of January 30, 2004, which is ten days after the filing date of this application. The only priority claimed by the ‘226 application is to British Patent Application 0118749.1 (the ‘749.1 application), which was filed on August 1, 2001. This priority claim is invalid because the filing date of the ‘749.1 application is more than one year before the filing date of the ‘226 application. 35 U.S.C. § 119(a). The Examiner of the ‘226 application

rejected the priority claim on page 7 of the Non-Final Office Action dated May 6, 2005 (copy enclosed). Without the benefit of the filing date of the '749.1 application, the '226 application is not prior art under 35 U.S.C. § 102(e) with respect to this application. Applicants respectfully request that it be withdrawn as a prior art reference.

The '769 Publication

It is likely that the '226 application was intended to be a national stage application of PCT International Application No. PCT/US02/23808, filed July 26, 2002, which published as PCT Publication No. WO 03/011769 (the '769 publication) on February 13, 2003. The content of the '769 publication is similar to the content of the '326 publication. Within these remarks, it will be assumed that the rejections presented in the Office action are based on the '769 publication, rather than the '326 publication. All citations to "Souter" will refer to the page numbers of the '769 publication.

Souter discloses compositions for purifying contaminated drinking water. These compositions include many classes of materials. The Office action cites six of these classes of materials: the primary coagulant, the coagulant aid, the microbiocidal disinfectant, the oxidant, the silicate and the alkali agent. Souter discloses examples of several of these classes of materials:

- Among the examples of primary coagulants, the Office action cites inorganic metal salts, such as copper chloride.
- Among the examples of coagulant aids, the Office action cites compounds having a quaternary ammonium group.
- Among the examples of microbiocidal disinfectants, the Office action cites silver salt, colloidal silver, calcium hypochlorite and quaternary ammonium compounds.
- Among the examples of alkali agents, the Office action cites carbonates and oxides.

Independent claims 1 and 30 have been amended to recite "a silver compound" as the antimicrobial metallic compound. Support for this amendment can be found, for example, in the specification at page 8, lines 13-17. Independent claim 31 already recites "a silver compound."

Souter fails to disclose the combination of a quaternary ammonium compound, an oxidizing agent and a silver compound. All of the combinations disclosed in Souter are lacking either a silver

compound or a quaternary ammonium compound. Souter does not disclose or even teach the use of more than one compound from the microbiocidal disinfectant category.

The Office action mentions the coagulant aids disclosed in Souter, which include polymeric materials with amine groups, such as quaternary ammonium groups. The possible presence of a quaternary ammonium group, however, does not make these polymeric materials quaternary ammonium compounds. The quaternary ammonium compounds recited in the claims of this application are described on page 6 of the specification as “ammonium salts in which all four of the ammonium’s hydrogen atoms have been replaced by organic groups.” Polymeric materials with amine groups are not ammonium salts.

Independent claims 1, 30 and 31 also have been amended to recite “citric acid.” Support for this amendment can be found, for example, in the specification at page 11, lines 11-16. As acknowledged in the Office action, Souter does not disclose citric acid.

Independent claims 1 and 30 also can be distinguished from Souter because Souter does not disclose sustained antimicrobial treatment. Instead, Souter discloses antimicrobial treatments that are terminated by a neutralization step or a filtration step. Souter, pages 19, 20, 36 and 37. This is consistent with the treatment of drinking water, which is consumed rapidly after treatment. In contrast, claims 1 and 30 are directed to the antimicrobial treatment “dental unit water,” which is maintained in a reservoir, such as a dental-unit reservoir.

Dependent claims 3-6, 8, 9, 11-13, 18, 20, 21, 23 and 34 each are allowable for the reasons stated for the corresponding independent claim. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, dependent claims 5 and 20 recite an “oxidizing agent [that] forms hydrogen peroxide or a peroxyacid in solution.” None of the components of the water-treatment composition disclosed in Souter share this property. Souter does disclose sodium percarbonate, but not as a component of the water-treatment composition. Instead, sodium percarbonate is disclosed as a neutralizing agent that is added to the water subsequent to antimicrobial treatment. Souter, pages 19-20.

Souter also fails to disclose any of the specific oxidizing agents disclosed in dependent claims 6 and 21, as amended. These claims were amended to exclude calcium hypochlorite and sodium chlorite. Although these compounds are within the definition of the term “oxidizing agents,”

as it appears elsewhere in the claims, for some embodiments of this invention, oxidizing agents containing chlorine are not preferred, as disclosed in the specification at page 7, lines 16-27. In contrast, Souter discloses a preference for “chlorine-based” disinfectants. Souter, page 7.

Claims 10, 26, 27, 32 and 35 have been cancelled, so the rejection of these claims is moot.

IV. Rejection of Claims 36, 44 and 45 over Souter - 35 U.S.C. § 102(e)

Claims 36, 44 and 45 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Souter. Applicants respectfully traverse this rejection and request that it be withdrawn.

Independent claim 36 has been amended to recite “a silver compound” as the antimicrobial metallic compound and to recite “citric acid.” Support for these amendments can be found, for example, in the specification at page 8, lines 13-17 and page 11, lines 11-16, respectively. As discussed above, Souter fails to disclose the combination of a quaternary ammonium compound, an oxidizing agent and a silver compound. Souter also fails to disclose citric acid. Since Souter does not disclose this composition, it cannot disclose providing this composition to cause sustained antimicrobial activity in a water supply, as recited in independent claim 36. Furthermore, as discussed above, Souter fails to even disclose sustained antimicrobial treatment.

Dependent claims 44 and 45 each are allowable for the reasons stated for independent claim 36, from which they depend. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, claim 45, as amended, recites concentration ranges for the silver compound and the citric acid. Support for the amendment of claim 45 can be found, for example, in the specification at page 11, lines 3-10. The recited citric acid concentration range is not disclosed in Souter, because Souter does not disclose citric acid. In addition, the recited silver concentration range of about 0.05 mg/L to about 0.5 mg/L as silver is below the lower limit of each of the concentration ranges cited in Souter for the microbiocidal disinfectant. Souter, page 21.

V. Rejection of Claims 58-62 over Souter - 35 U.S.C. § 102(e)

Claims 58-62 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Souter. Applicants respectfully traverse this rejection and request that it be withdrawn.

Independent claim 58 has been amended to recite “a silver compound” as the antimicrobial metallic compound and to recite the additional step of “providing citric acid.” Support for these amendments can be found, for example, in the specification at page 8, lines 13-17 and page 11, lines 11-16, respectively. With these amendments, claim 58 is allowable for at least the same reasons as claims 1, 30, 31 and 36, as described above.

Claims 59-62 have been cancelled, so the rejection of these claims is moot.

VI. Rejection of Claim 63 over Scepanski - 35 U.S.C. § 102(b)

Claim 63 was rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,977,183 (Scepanski). Claim 63 has been cancelled, so this rejection is moot.

VII. Rejection of Claims 2, 7, 19 and 22 over Souter - 35 U.S.C. § 103(a)

Claims 2, 7, 19 and 22 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Souter. Applicants respectfully traverse this rejection and request that it be withdrawn.

Dependent claims 2, 7, 19 and 22 each are allowable for the reasons stated for independent claim 1, from which they depend. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, dependent claims 7 and 22 recite “sodium percarbonate” as a specific oxidizing agent well suited for use in the recited antimicrobial composition. The Office action alleges that it would have been obvious to use sodium percarbonate “as the oxidant” in the compositions disclosed in Souter. Souter discloses the incorporation of an oxidant “for preventing or reducing manganese-associated post-flocculation discoloration.” Souter, page 4. All of the examples of oxidants disclosed in Souter as suitable for this purpose are transition-metal based. Souter, pages 8-9. A person of ordinary skill in the art would have had no motivation to select sodium percarbonate for this purpose.

In addition, as discussed above, sodium percarbonate is disclosed in Souter as a neutralizing agent that is added to the water subsequent to antimicrobial treatment. Souter, pages 19-20. In particular, sodium percarbonate is disclosed as a compound useful to “reduce or remove excess disinfectant prior to use.” Souter, page 19. Souter must be viewed as a whole. MPEP § 2141.02. Viewed as a whole, Souter suggests that incorporating sodium percarbonate into the water treatment

composition would result in the premature neutralization of the antimicrobial agent. Contrary to the assertions in the Office action, a person of ordinary skill in the art would not have been motivated to include sodium percarbonate in the composition disclosed in Souter.

VIII. Rejection of Claims 1-6, 8-13 and 18-23 over Hass in view of Souter - 35 U.S.C. § 103(a)

Claims 1-6, 8-13 and 18-23 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over European Patent No. 0 059 978 (Hass) in view of Souter. Applicants respectfully traverse this rejection and request that it be withdrawn.

As discussed above, independent claim 1 has been amended to recite “citric acid.” Neither Souter nor Hass discloses citric acid. Furthermore, there is no suggestion or motivation in the prior art that would have made it obvious to modify the combination of Souter and Hass to include citric acid.

Dependent claims 2-6, 8, 9, 11-13 and 18-23 each are allowable for the reasons stated for independent claim 1, from which they depend. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, dependent claim 18 recites the composition of claim 1 “in tablet form.” Hass fails to disclose compositions in tablet form and a person of ordinary skill in the art would have had no motivation to combine the disclosure of tablets in Souter with the compositions disclosed in Hass. Souter discloses tablet dosage forms for the treatment of “relatively small predetermined volume[s] of contaminated drinking water.” Souter, pages 10-11. In contrast, Hass discloses compositions for the treatment of relatively large quantities of water. For example, in Examples 1 and 2 of Hass, the volumes of treated water are 100 cubic meters (100,000 liters) and 10 cubic meters (10,000 liters), respectively. Hass (translation), pages 5-6. If the compositions disclosed in Hass were administered in tablet form, the tablets would have to be very large in size, even many kilograms, in order to deliver sufficient concentrations of the antimicrobial agents. Such tablets would be difficult to handle and slow to dissolve, thereby defeating Hass’s stated goal of “germ-killing ... achieved in a period of seconds or minutes.” Hass (translation), page 2.

Claim 10 has been cancelled, so the rejection of this claim is moot.

IX. Rejection of Claims 1-25, 31-34, 64 and 65 over Scepanski in view of Antelman - 35 U.S.C. § 103(a)

Claims 1-25, 31-34, 64 and 65 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Scepanski in view of U.S. Patent No. 5,073,382 (Antelman). Applicants respectfully traverse this rejection and request that it be withdrawn.

Scepanski discloses substantially solid antimicrobial compositions for use in laundry and hard surface cleaning. Scepanski, Abstract. Among other components, these antimicrobial compositions can include quaternary ammonium compounds, sequestering agents, and alkaline builders. Scepanski, column 2, lines 50-58 and column 8, line 66 to column 9, line 30. Scepanski discloses 14 types of sequestering agents, including organic polycarboxylic acids, such as citric acid. Scepanski, column 9, line 52 to column 10, line 38. Scepanski also discloses many types of alkaline builders, including sodium carbonate and potassium carbonate. Scepanski, column 9, lines 11-20. Antelman discloses “alkaline divalent silver (Ag(II)) bactericidal compositions.” Antelman, column 1, lines 6-8.

The Office action alleges that it would have been obvious to a person of ordinary skill in the art to add the silver compounds disclosed in Antelman to the compositions disclosed in Scepanski. Scepanski and Antelman, however, provide no suggestion or motivation for the use of more than one antimicrobial agent. These references disclose cleaning compositions that do not benefit from sustained antimicrobial activity. Since neither reference recognizes a need for sustained antimicrobial activity, they certainly do not suggest or motivate the use of combinations of antimicrobial agents to achieve sustained antimicrobial activity.

Scepanski and Antelman also fail to provide any suggestion or motivation for the particular combination of citric acid and a silver compound. The genus of sequestering agents disclosed in Scepanski is very broad. Scepanski, column 9, line 52 to column 10, line 38. Selection of citric acid from this genus and selection of a silver compound from the even broader genus of antimicrobial compounds would not have been obvious to a person of ordinary skill in the art. As disclosed in Applicants’ specification, for example at page 11, lines 11-16, the citrate ion loosely binds silver and facilitates its antimicrobial activity in solution. This synergy is an unexpected result and would not have been obvious based on Scepanski and Antelman. In fact, Antelman teaches away from this combination by specifically disclosing an *inorganic* complex of divalent silver. Antelman, Abstract.

Citric acid, of course, is an organic compound and forms an organic complex with silver ions in solution.

For the reasons stated above, independent claims 1 and 31, which recite “a silver compound” and “citric acid,” are not rendered obvious by Scepanski in view of Antelman. Dependent claims 2-9, 11-13, 16, 18-23 and 34 each are allowable for the reasons stated for the corresponding independent claim. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.

For example, dependent claims 5 and 20 recite an “oxidizing agent [that] forms hydrogen peroxide or a peroxyacid in solution.” Dependent claims 6 and 21 recite several suitable oxidizing agents and dependent claims 7 and 22 specifically recite “sodium percarbonate.” Sodium percarbonate and other compounds that form hydrogen peroxide or a peroxyacid in solution are capable of killing microbes by oxidation. They are not well-suited, however, for use as alkaline builders. Hydrogen peroxide and peroxyacids typically lower the pH of a solution. Therefore, a person of ordinary skill in the art would not have been motivated to use such compounds as alkaline builders in the compositions disclosed in Scepanski.

Claims 10, 14, 15, 17, 24, 25, 32, 33, 64 and 65 have been cancelled, so the rejection of these claims is moot.

X. Rejection of Claims 17 and 25 over Souter in view of Owades - 35 U.S.C. § 103(a)

Claims 17 and 25 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Souter in view of U.S. Patent No. 6,610,275 (Owades). Claims 17 and 25 have been cancelled, so this rejection is moot.

XI. Rejection of Claims 28 and 29 over Souter in view of Owades - 35 U.S.C. § 103(a)

Claims 28 and 29 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Souter in view of U.S. Patent No. 6,610,275 (Owades). Applicants respectfully traverse this rejection and request that it be withdrawn.

Dependent claim 29 is allowable for the reasons stated for independent claim 1, from which it depends. Dependent claim 29 is further allowable in view of the patentable combination of features that it recites.

Claim 28 has been cancelled, so the rejection of this claim is moot.

XII. Additional References

U.S. Patent 6,555,055 (Cisar) and U.S. Patent No. 6,019,905 (Waggoner) were cited in the Office action as allegedly being pertinent to Applicant's disclosure. These references have been considered, but have been found not to disclose or suggest the subject matter of any of the pending claims.

XIII. Objected-To Claims

Applicants acknowledge with appreciation the Examiner's indication that claims 37-43 would be allowable if rewritten in independent form. Claims 37, 40 and 43 each have been amended to include all of the limitations of independent claim 36. Claims 38 and 39 depend from claim 37 and, therefore, also should be allowable. Claims 41 and 42 depend from claim 40, and, therefore, also should be allowable.

Allowance of these claims is requested.

XIV. Allowed Claims

Applicants acknowledge with appreciation the allowance of claims 46-57.

XV. New Claims

Applicants have added claims 66-85 to further claim the patentable features of the invention. Support for new claims 66, 73 and 84 can be found, for example, in the specification at page 19, Table 1. Support for new claims 67 can be found, for example, in the specification at page 14, line 22 to page 15, line 3 and page 17, line 18 to page 18, line 2. Support for new claims 68 and 74 can be found, for example, in the specification at page 10, lines 5-7 and page 19, line 11 to page 20, line 3. Support for new claims 69, 75 and 79 can be found, for example, in the specification at page 3, lines 20-21. Support for new claims 70, 76, 80 and 83 can be found, for example, in the specification at page 13, lines 1-7. Support for new claims 71, 77 and 81 can be found, for example, in the specification at page 11, lines 11-16. Support for new claims 72, 78, 82 and 85 can be found, for example, in the specification at page 11, lines 15-16 and page 12, lines 10-16.

Dependent claims 66-85 each are allowable because they depend from an objected-to claim rewritten in independent form or an allowable claim. Each of these dependent claims is further allowable in view of the patentable combination of features recited in such dependent claim.


XVI. Conclusion

It is respectfully submitted that the present claims are in condition for allowance. Should there be any questions regarding this application, Examiner Hoey is invited to contact the undersigned attorney at the telephone number shown below.

Respectfully submitted,

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